

What is claimed is:

1. A gold (Au) alloy bonding wire for a semiconductor device in which at least one of polonium (Po), promethium (Pm), thulium (Tm), and boron (B) is added to high-purity gold of 99.999% or more in an amount of 3-30 parts per million (ppm)  
5 by weight and at least one of magnesium (Mg), sodium (Na), vanadium (V), molybdenum (Mo), and technetium (Tc) is added in an amount of 3-30 ppm by weight to the high-purity gold.
2. The Au alloy bonding wire of claim 1, wherein palladium (Pd) is further  
10 added to the high-purity gold in an amount of 100-1,000 ppm by weight.
3. The Au alloy bonding wire of claim 1, wherein calcium (Ca) is further added to the high-purity gold in an amount of 30-80 ppm by weight.
- 15 4. The Au alloy bonding wire of claim 1, wherein lanthanum (La) is further added to the high-purity gold in an amount of 20-80 ppm by weight.
5. The Au alloy bonding wire of claim 2, wherein Ca is further added to the high-purity gold in an amount of 30-80 ppm by weight.  
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6. The Au alloy bonding wire of claim 2, wherein La is further added to the high-purity gold in an amount of 20-80 ppm by weight.
7. The Au alloy bonding wire of claim 3, wherein La is further added to the  
25 high-purity gold in an amount of 20-80 ppm by weight.
8. The Au alloy bonding wire of claim 5, wherein La is further added to the high-purity gold in an amount of 20-80 ppm by weight.
- 30 9. The Au alloy bonding wire of claim 8, wherein a diameter of the Au alloy bonding wire is 10-50  $\mu\text{m}$ .